VOLUME 24 NOS. 1–4
Special Issue
CLOUD PHYSICS CONFERENCE, PART 1

Edited by
H.D. ORVILLE
Department of Meteorology, South Dakota School of Mines and Technology, Rapid City, SD 57701–3995 (U.S.A.)

CONTENTS

Preface 1

Instrumentation in cloud physics
The effect of ice water content on space-borne microwave remote sensing
J.-L. Liu, J.-M. Xiao and L. Zhang (Beijing, P.R. China) 5
Lidar observation of time and spatial variations of backscattering coefficient near the stratiform cloud base
I.N. Kolev, O.P. Parvanov, B.K. Kaprielov and S.I. Kolev (Sofia, Bulgaria) 13
Study on cloud ande rain by microwave radiometer observation
B. Zhao (Beijing, P.R. China) 33
A vertical wind tunnel for the study of snowflakes and effects of accumulated snow on materials
K. Isono (Tokyo, Japan), T. Gonda (Chiba, Japan), Y. Sasyo and J. Kobayashi (Tokyo, Japan) 45
The collection efficiency of a massive fog collector
R.S. Schemenauer and P.I. Joe (Downsview, Ont., Canada) 53
An airborne video-microscope for measuring cloud particles
T. Tanaka, T. Matsuo, K. Okada, I. Ichimura (Tsukuba, Japan), S. Ichikawa and A. Tokuda (Tokyo, Japan) 71

Microphysical characterization of clouds
The supercooling of surface water skins of spherical and spheroidal hailstones
R. List (Toronto, Ont., Canada), F. Garcia-Garcia (Mexico, Mexico), R. Kuhn (Winnipeg, Man., Canada) and B. Greenan (Toronto, Ont., Canada) 83
The size distribution of submicrometer particles within and about stratocumulus cloud droplets on Mt. Åreskutan, Sweden
J. Heintzenberg, J.A. Ogren, K.J. Noone and L. Gärdneus (Stockholm, Sweden) 89
Microphysical observations in winter storms over the Atlas Mountains in Morocco
O. Baddour (Casablanca, Morocco) and R.M. Rasmussen (Denver, Colo., U.S.A.) 103
Microphysical characteristics of some convective clouds over Oklahoma
M.R. Poellot (Grand Forks, N.D., U.S.A.) and J.C. Pflaum (Norman, Okla., U.S.A.) 123
Three-dimensional structures of natural snow crystals shown by stereo-photomicrographs
K. Iwai (Nagano, Japan) 137
Interior characteristics at mid-levels of thunderstorms in the southeastern United States
D.J. Musil and P.L. Smith (Rapid City, S.D., U.S.A.) 149
Evaporation and melting of ice crystals: A laboratory study
R.G. Oraltay and J. Hallett (Reno, Nev., U.S.A.) 169

Numerical modelling of microphysical and radiative processes

Test of a parametrization scheme for cloud microphysical processes in a 3-D mesoscale model
L. Levkov, D. Jacob, D. Eppel and H. Graßl (Geesthacht, F.R. Germany) 193

Evaluation of cloud microphysics parameterizations for mesoscale simulations
I.Y. Lee (Argonne, Ill., U.S.A.) 209

Numerical simulation of coastal clouds when solar radiation is blocked by smoke
C.R. Molenkamp (Livermore, Calif., U.S.A.) 221

Empirical equations of ice crystal growth microphysics for modeling and analysis, I. Mass and dimensions
C.R. Redder and N. Fukuta (Salt Lake City, Utah, U.S.A.) 247

The effects of the nonsphericity and size distribution of ice crystals on the radiative properties of cirrus clouds
S. Kinne (Moffett Field, Calif., U.S.A.) and K.-N. Liou (Salt Lake City, Utah, U.S.A.) 273

Numerical modelling of convective processes

Smooth-particle hydrodynamics as applied to 2-D plume convection
A.M. Gadian (Manchester, Great Britain), J. Dorman (Middlesbrough, Great Britain) and J.S.A. Green (Norwich, Great Britain) 287

Dynamic entrainment rate influence on products of a one-dimensional cumulonimbus model
M. Ćurić and D. Janc (Belgrade, Yugoslavia) 305

Drag effects in convective drafts
K.E. Haman and S.P. Malinowski (Warsaw, Poland) 325

On the role of precipitation in maintenance of downdrafts in cumulonimbus clouds
H. Pawłowska-Mankiewicz (Warsaw, Poland) 333

The primary cloud physics mechanisms of microburst formation
H.D. Orville, R.D. Farley, Y.-C. Chi and F.J. Kopp (Rapid City, S.D., U.S.A.) 343